

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Yun Soo CHOE et al.

Serial No. 10/652,493

Group Art Unit: 3742

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Examiner: Sang Yeop Paik

For: HEATING CRUCIBLE FOR ORGANIC THIN FILM FORMING APPARATUS

REPLY BRIEF

Mail Stop Appeal Brief—Patents
Commissioner for Patents
P.O. Box 1450
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Sir:

This Reply Brief is being filed under 37 CFR 41.41 in response to the Examiner's Answer mailed November 8, 2007, and having a period for response set to expire on January 8, 2008, under 37 CFR 41.41(a)(1), and the Advisory Action mailed November 8, 2007.

A Request for Oral Hearing is being submitted with this Reply Brief.

The sections of this Reply Brief have the same numbers as the corresponding sections of the Appeal Brief of April 19, 2007, but only those sections that have changed are included in this Reply Brief.

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III. STATUS OF CLAIMS (UPDATED)

Claims 1-4 and 7-31 are pending, with claims 1 and 28 being independent.

Claims 5 and 6 have been canceled.

Claim 28 has been allowed.

Claims 1-4, 7-27, and 29-31 have been rejected.

Claims 1-4, 7-27, and 29-31 are on appeal.

IV. STATUS OF AMENDMENTS (UPDATED)

An Amendment After Final Rejection was filed on February 7, 2006, in response to the Final Office Action of November 17, 2005.

In the Advisory Action of March 1, 2006, the Examiner indicated that, for purposes of appeal, the Amendment After Final Rejection of February 7, 2006, would be entered.

A Request for Continued Examination (RCE) and an Amendment were filed on March 16, 2006, in response to the Advisory Action of March 1, 2006. On page 1 of the Amendment of March 16, 2006, the applicants requested that the Amendment After Final Rejection of February 7, 2006, not be entered. The Amendment of March 16, 2006, amended the application as it appeared prior to the Amendment After Final Rejection of February 7, 2006.

On page 7 of the Amendment of July 27, 2006, and page 6 of the Request for Reconsideration After Final Rejection of December 11, 2006, the applicants pointed out that the image file wrapper of the application indicates that the Amendment After Final Rejection of February 7, 2006, is to be entered, and requested that the Examiner have the image file wrapper of the application corrected to indicate that the Amendment After Final Rejection of February 7, 2006, is not to be entered. In response to these requests, the Examiner stated as follows in the Advisory Action of January 4, 2007:

It is also noted that the amendment after final mailed on 2/7/06 is properly considered and entered by the examiner. No request was made at that time by the applicant whether to enter or not enter the paper mailed on 2/7/06. However, it is noted that after the prosecution is closed, it is the examiner's discretion whether to

ener [sic] the response [sic] or not, and once it is entered, it would not be made un-entered.

However, the Advisory Action of March 1, 2006, indicated that the Amendment After Final Rejection of February 7, 2006, would be entered for purposes of appeal, and the applicants did not pursue an appeal at that time, but filed the Request for Continued Examination (RCE) and the Amendment of March 16, 2006, in which they requested that the Amendment After Final Rejection of February 7, 2006, not be entered. Furthermore, MPEP 706.07(h)(III)(D) provides that "[i]f conflicting amendments have been previously filed, applicant should clarify which amendments should be entered upon filing the RCE."

Nevertheless, it appears that this issue is essentially moot for the following reasons. The Amendment After Final Rejection of February 7, 2006, presented amendments to the drawings and arguments. The Amendment of March 16, 2006, repeated the amendments to the drawings and the arguments that were presented in the Amendment After Final Rejection of February 7, 2006, and also presented amendments to the specification and the claims and additional arguments. Accordingly, it is submitted that the current state of the application would be the same regardless of whether the Amendment After Final Rejection of February 7, 2006, has been entered.

A Request for Reconsideration After Final Rejection that did not present any amendments but presented only arguments was filed on December 11, 2006, in response to the Final Office Action of October 12, 2006.

In the Advisory Action of January 4, 2007, the Examiner stated that "[t]he reply filed 11 December 2006 fails to place this application in condition for allowance," and that "[t]he request for reconsideration has been considered but does NOT place the application in condition for allowance because: the applicant's arguments are not deemed persuasive."

An Amendment After Appeal Under 37 CFR 41.33(b)(2) rewriting allowable claim 28 in independent form was filed on September 18, 2007.

In the Advisory Action of November 8, 2007, the Examiner indicated that the Amendment After Appeal Under 37 CFR 41.33(b)(2) of September 18, 2007, has been entered, and that claim 28 has been allowed.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (UPDATED)

1. Whether claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31 are unpatentable under 35 USC 103(a) over Chow (U.S. Patent No. 5,157,240) in view of Chandler (U.S. Patent No. 2,799,764) or Isaacson et al. (Isaacson) (U.S. Patent No. 3,842,241).
2. Whether claims 3, 14, and 19 are unpatentable under 35 USC 103(a) over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, and further in view of Kano et al. (Kano) (U.S. Patent No. 6,242,719).
3. Whether claims 8, 15, and 26 are unpatentable under 35 USC 103(a) over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, and further in view of Bicht (U.S. Patent No. 6,162,300).
4. Whether claim 10 is unpatentable under 35 USC 103(a) over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29 (presumably intended to be claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31), and further in view of Okuda et al. (Okuda) (U.S. Patent No. 4,804,823).
5. Whether claim 20 is unpatentable under 35 USC 103(a) over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29 (presumably intended to be claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31), and further in view of Takagi (U.S. Patent No. 4,217,855).
6. Whether claim 27 is unpatentable under 35 USC 103(a) over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, and further in view of Chen et al. (Chen) (U.S. Patent No. 6,024,799) or Murakami et al. (Murakami) (U.S. Patent No. 5,728,223).

VII. ARGUMENT (ADDITIONAL)

This section contains additional arguments responding to the new arguments presented by the Examiner on pages 8-13 of the Examiner's Answer of November 8, 2007. These additional arguments supplement the arguments in Section VII—Argument on pages 10-41 of the Appeal Brief of April 19, 2007.

Also, the arguments in Section VII—Argument on pages 10-41 of the Appeal Brief of April 19, 2007, contain arguments that refer to various sections of the Manual of Patent Examining Procedure (MPEP). Some of these MPEP sections were deleted or revised in the September 2007 revision of the MPEP, which was released after the Appeal Brief of April 19, 2007, was filed, primarily in view of the decision of the Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007), which was decided on April 30, 2007, after the Appeal Brief of April 19, 2007, was filed. Accordingly, this section contains additional arguments referring to new or revised MPEP sections where necessary.

Rejection 1—Claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31

The arguments with respect to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31 on page 10 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.03 (citing *In re Royka*) in the third paragraph on page 10. However, the portion of the MPEP relied on there has been deleted in the September 2007 revision of the MPEP.

Pursuant to the September 2007 revision of MPEP 2142, the Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness; if the Examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness; and the key to supporting any rejection under 35 USC 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. However, for the reasons discussed below, it is submitted the Examiner has not clearly articulated reasons why Chow, Chandler, and Isaacson disclose or suggest various features of claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, such that the Examiner has not established a *prima facie* case of obviousness with respect to these claims pursuant to MPEP 2142.

Claims 1 and 23—"heat-resistant layer" features

On pages 8 and 9 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

The applicant argues Chow, Chandler, and Isaacson do not disclose or teach the recited "heat-resistant layer formed on a surface of the cover heater." The applicant argues that the layer (25, 25') shown in Chow is not a "heat-resistant layer" but is rather a protective layer that shows nothing whatsoever as the "heat-resistant layer." The applicant's argument is not deemed persuasive. The term "heat-resistant" is such a broad terminology. The examiner has raised the broadness of such term in the non final office action mailed on 5/2/06 as well as in the final office action 10/12/06 and discussed that a "heat-resistant layer" can be broadly interpreted as any layer that "impedes a heat transfer." Furthermore, the examiner's interpretation of the "heat-resistant material" is also based on the applicant's own disclosure wherein it states that the "heat-resistant layer" is a thin film type (see page 7, paragraph 35). This interpretation is also supported by the applicant [*sic*] own submission as stated on page 13, 3rd paragraph of the appeal brief. Thus, in absence of any other claimed structure or material regarding the recited "heat-resistant layer" and further in light of the applicant's own specification, the examiner's interpretation of the Chow layer (25, 25'), which is a thin layer type made of pyrolytic boron nitride, meets claimed scope of the recited term "heat-resistant layer". Furthermore, the examiner's interpretation of the "heat-resistant material" as the layer that impedes a heat transfer is also deemed reasonable in light of the applicant's newly submitted English translation of Korean priority document 2002-52898 which refers [*sic*] the "heat-resistant layer" as an "adiabatic layer" that "block transmission of heat."

The applicant further argues that such interpretation is unreasonable because it ignores the limitation of "heat-resistant" in the "heat-resistant layer." The applicant seems to suggest that since Chow calls the layer as "protective layer", it can only serve or function as a protective layer and no other purpose. However, it is noted that there is a well established controlling authority that when the structure or material recited in the prior art is substantially identical to that of the claims, the claimed properties or functions are assumed to be inherent. In this case, the recited structural limitation of the "heat-resistant layer" is a layer which is disclosed as a thin film type, and Chow which clearly shows such recited structural limitation, the recited "heat-resistant" property is deemed inherent.

However, the Examiner has not identified the "well established controlling authority" upon which he has relied, which makes it difficult for the applicants to respond to the rejection. Furthermore, the Examiner has apparently lost sight of the fact that the structural limitation that is disclosed in the applicants' specification and recited in claims 1 and 23 is a heat-resistant layer, not a thin film. The mere fact that paragraph [0035] of the specification discloses that the heat-resistant layer recited in claims 1 and 23 is formed as a thin film type does not somehow convert the structural limitation of a heat-resistant layer recited in claims 1 and 23 into a thin film. Nor does the mere fact that Chow's protective layers 25' and 25 are made of pyrolytic boron nitride from 1.0 to a few mils thick somehow make Chow's protective layers 25' and 25 a heat-resistant layer as recited in claims 1 and 23 as alleged by the Examiner.

It is submitted that whether a layer is a heat-resistant layer as recited in claims 1 and 23 depends, for example, at least on what the layer is made of, and how thick the layer is. Here, the Examiner has not provided a basis in fact and/or technical reasoning, as required by MPEP 2112(IV) and *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990), to reasonably support his determination that Chow's protective layers 25' and 25 made of pyrolytic boron nitride from 1.0 to a few mils thick are inherently a heat-resistant layer as recited in claims 1 and 23, or an adiabatic layer that blocks transmission of heat. Rather, the Examiner's determination is based solely on the fact that paragraph [0035] of the applicants' specification discloses that the heat-resistant layer recited in claims 1 and 23 is formed as a thin film type, and that Chow's protective layers 25' and 25 made of pyrolytic boron nitride are from 1.0 to a few mils thick. The Examiner concludes that since the heat-resistant layer recited in claims 1 and 23 is disclosed as being a thin film type and Chow's protective layers 25' and 25 are thin layers, then Chow's protective layers 25' and 25 are also a heat-resistant layer as recited in claims 1 and 23. Thus, the Examiner has improperly interpreted the structural limitation of a heat resistant layer recited in claims 1 and 23 as if it were merely a thin layer.

With respect to the Examiner's statement that "[t]his interpretation is also supported by the applicant [*sic*] own submission as stated on page 13, 3rd paragraph of the appeal brief," the Examiner is presumably referring to his interpretation in the following statements on page 8 of the Examiner's Answer of November 8, 2007:

The term "heat-resistant" is such a broad terminology. The examiner has raised the broadness of such term in the non final

office action mailed on 5/2/06 as well as in the final office action 10/12/06 and discussed that a "heat-resistant layer" can be broadly interpreted as any layer that "impedes a heat transfer."

However, in the third paragraph on page 13 of the Appeal Brief of April 19, 2007, the applicants argue that the term "heat-resistant layer" in claims 1 and 23 refers to a layer that blocks transmission of heat. In contrast, the Examiner is arguing that a heat-resistant layer is any layer that impedes a heat transfer. It is submitted that there is a difference between a layer that blocks transmission of heat, and a layer that impedes a heat transfer, and that a layer may be a layer that impedes a heat transfer but does not block transmission of heat. Furthermore, the Examiner has not provided any evidence to establish that Chow's protective layers 25' and 25 made of pyrolytic boron nitride that are from 1.0 to a few mils thick impede a heat transfer. Thus, the Examiner's position appears to be that any layer impedes a heat transfer, and therefore any layer is "a heat-resistant layer" as recited in claims 1 and 23.

Pursuant to MPEP 2111, during patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). However, the broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999).

Here, it is submitted that the Examiner's interpretation is unreasonable because it effectively ignores the limitation "heat-resistant" in the term "heat-resistant layer" recited in claims 1 and 23. In effect, the Examiner has interpreted claims 1 and 23 as if they recited simply "a layer," rather than "a heat-resistant layer." It is submitted that this interpretation is also inconsistent with the interpretation that those skilled in the art would reach.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 10-15 of the Appeal Brief of April 19, 2007, it is submitted that the Chow's protective layers 25' and 25 are not a "heat-resistant layer" as recited in claims 1 and 23 as alleged by the Examiner.

Claims 1 and 24—"reflective layer" features

Chandler

The arguments with respect to Chandler on pages 15-18 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.03 on page 16, last full paragraph. The portion of the MPEP relied on there has been renumbered MPEP 2143.03(III) in the September 2007 revision of the MPEP.

The arguments with respect to Chandler on pages 15-18 of the Appeal Brief of April 19, 2007, refer to MPEP 2141(II) (citing *Hodosh v. Block Drug Co., Inc.*) on page 17.

However, the portion of the MPEP relied on there has been deleted in the September 2007 revision of the MPEP. However, pursuant to MPEP 2145(X)(A), "[a]ny judgement on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper." *In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

Here, as discussed on page 18 of the Appeal Brief of April 19, 2007, it is submitted that the only suggestion that Chandler's backing layer 78 might serve as a "heat-resistant layer" as recited in claims 1 and 24 is contained in the applicants' disclosure, which the Examiner cannot rely on as a basis to reject the applicants' claims. That is, it is submitted that the only way that it might have occurred to one of ordinary skill in the art at the time the invention was made that Chandler's backing layer 78 might serve as a "heat-resistant layer" as recited in claims 1 and 24 is by reading the applicants' disclosure. Accordingly, it is submitted that the Examiner's position that Chandler's backing layer 78 might serve as a "heat-resistant layer" as recited in claims 1 and 24 includes knowledge gleaned only from the applicants' disclosure, and thus is based on a hindsight reconstruction of the invention arrived at by reading the applicants' disclosure that is improper pursuant to MPEP 2145(X)(A), *supra*.

On page 9 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

With respect to Chandler, the applicant argues that the layer (78) in Chandler is made of "paper, paperboard, cloth, or other suitable material", and such material is not a heat-resistant

but nothing more than backing layer as Chandler intended to apply. As in the final office action, the examiner has raised the issue that it is notoriously known that paper and cloth can be a heat-resistant material as it is experienced in daily livelihood where a paper towel or cloth is used as a heat-resistant material to hold and removed [*sic*] a hot pan off a stove. This example is shown to provided [*sic*] that materials such as paper and cloth can be a heat-resistant material/layer.

It is noted, however, that Chandler is applied to teach the recited reflective layer and not a heat resistant layer, and Chandler clearly shows the reflective layer as the element (62) that is disposed between a heating element and a heat resistant layer 78.

The Examiner has cited Chandler to show that it was known in the art to place a reflective layer between a heater and a heat-resistant layer as recited in claims 1 and 24. However, if one of ordinary skill in the art would not have recognized that Chandler discloses a heat-resistant layer as recited in claims 1 and 24, then Chandler cannot teach that it was known in the art to place a reflective layer between a heater and a heat-resistant layer as recited in claims 1 and 24 as alleged by the Examiner. Here, the Examiner has taken the position that the backing layer 78 in FIG. 5 of Chandler is a heat-resistant layer as recited in claims 1 and 24 because column 7, lines 35-38, of Chandler, states that the backing layer 78 may be made of paper, paperboard, cloth, or other suitable material, and the Examiner is of the opinion that it is notoriously well known that paper and cloth can be a heat-resistant material since, for example, a paper towel or cloth can be used as a heat-resistant material to hold and remove a hot pan from a stove.

However, the Examiner has not identified anything whatsoever in Chandler or elsewhere in the prior art to indicate that one of ordinary skill in the art would have recognized that Chandler's backing layer 78 made of paper, paperboard, cloth, or other suitable material can be a heat-resistant layer as recited in claims 1 and 24. Rather, the only suggestion that Chandler's backing layer 78 can be a heat-resistant layer as recited in claims 1 and 24 is contained in the applicants' disclosure. Accordingly, it is submitted that the Examiner's position that Chandler's backing layer 78 made of paper, paperboard, cloth, or other suitable material can be a heat-resistant layer as recited in claims 1 and 24 because it is notoriously well known that paper and cloth can be a heat-resistant material since, for example, a paper towel or cloth can be used as a heat-resistant material to hold and remove a hot pan from a stove is based solely on an

impermissible hindsight reconstruction of the invention arrived at by reading the applicants' disclosure.

Furthermore, pursuant to MPEP 2141.01(a)(I), to rely on a reference under 35 USC 103, the reference must be analogous art, and pursuant to MPEP 2141.01(a)(II), the Examiner must consider similarities and differences in structure and function in determining whether a reference is analogous prior art.

Here, it is submitted that Chandler is non-analogous art with respect to claims 1 and 24 and Chow because claims 1 and 24 and Chow are directed to a heating crucible, while Chandler is directed to a radiant heating panel. Furthermore, Chow's layers 25 and 25', which the Examiner considers to be "a heat-resistant layer" as recited in claims 1 and 24, are protective layers whose function is to keep Chow's heating elements 22, 24, 22', and 24' from being exposed to the substrate on which thin films are being deposited to prevent the thin films from being contaminated by deposits arising from the heating of the heating elements 22, 24, 22', and 24', while Chandler's layer 78, which the Examiner also considers to be "a heat-resistant layer" as recited in claims 1 and 24, is a backing layer whose function is not specifically discussed in Chandler, but appears to be to provide a smooth surface for directly attaching the radiant heating panel to a wall, ceiling, or floor of a room (see FIG. 5; column 3, lines 21-27; and column 7, lines 32-38, of Chandler). In light of these differences in function, it is submitted that Chandler is non-analogous art with respect to claims 1 and 24 and Chow pursuant to MPEP 2141.01(a)(II), such that the Examiner cannot rely on Chandler in the rejection of claims 1 and 24 under 35 USC 103(a) pursuant to MPEP 2141.04(a)(I).

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 15-18 of the Appeal Brief of April 19, 2007, it is submitted that Chow and Chandler do not disclose or suggest "a reflective layer between the cover heater and the heat-resistant layer" as recited in claim 1, or "a reflective layer between the body heater and the heat-resistant layer" as recited in claim 24.

Isaacson

The arguments with respect to Isaacson on pages 18 and 19 of the Appeal Brief of April 19, 2007, refer to MPEP 2141(II) (citing *Hodosh v. Block Drug Co., Inc.*) on page 19. However,

the portion of the MPEP relied on there has been deleted in the September 2007 revision of the MPEP.

However, as discussed on page 19 of the Appeal Brief of April 19, 2007, it is submitted that the only suggestion that Isaacson's holder 40 might serve as a "heat-resistant layer" as recited in claims 1 and 24 is contained in the applicants' disclosure, which the Examiner cannot rely on as a basis to reject the applicants' claims. That is, it is submitted that the only way that it might have occurred to one of ordinary skill in the art at the time the invention was made that Isaacson's holder 40 might serve as a "heat-resistant layer" as recited in claims 1 and 24 is by reading the applicants' disclosure. Accordingly, it is submitted that the Examiner's position that Isaacson's holder 40 might serve as a "heat-resistant layer" as recited in claims 1 and 24 includes knowledge gleaned only from the applicants' disclosure, and thus is based on a hindsight reconstruction of the invention arrived at by reading the applicants' disclosure that is improper pursuant to MPEP 2145(X)(A), *supra*.

On pages 9 and 10 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

Isaacson is also alternatively applied to show the reflective layer. The applicant argues that the layer (40) of Isaacson is a holder and not a heat-resistant layer, and further argues that the examiner has based the rejection on a hindsight reconstruction. This argument is not deemed persuasive since there is no reason why this layer (40) cannot be used as a heat-resistant layer, and there is no claimed structure or support to distinguish the claimed invention from that of the applied prior art.

The Examiner has cited Isaacson to show that it was known in the art to place a reflective layer between a heater and a heat-resistant layer as recited in claims 1 and 24. However, if one of ordinary skill in the art would not have recognized that Isaacson discloses a heat-resistant layer as recited in claims 1 and 24, then Isaacson cannot teach that it was known in the art to place a reflective layer between a heater and a heat-resistant layer as recited in claims 1 and 24 as alleged by the Examiner. Here, the Examiner has taken the position that there is no reason the holder 40 in FIGS. 2 and 3 of Isaacson, which may be in the form of a picture frame holder and constructed of plastic as described in column 2, lines 46-48, of Isaacson, cannot be used as a heat-resistant layer as recited in claims 1 and 24.

However, the Examiner has not identified anything whatsoever in Isaacson or elsewhere in the prior art to indicate that one of ordinary skill in the art would have recognized that there is no reason that Isaacson's holder 40 cannot be used as a heat-resistant layer as recited in claims 1 and 24. Rather, the only suggestion that Isaacson's holder 40 can be used as a heat-resistant layer as recited in claims 1 and 24 is contained in the applicants' disclosure. Accordingly, it is submitted that the Examiner's position that there is no reason that Isaacson's holder 40 cannot be used as a heat-resistant layer as recited in claims 1 and 24 is based solely on an impermissible hindsight reconstruction of the invention arrived at by reading the applicants' disclosure.

Furthermore, it is submitted that Isaacson is non-analogous art with respect to claims 1 and 24 and Chow because claims 1 and 24 and Chow are directed to a heating crucible, while Isaacson is directed to an aquarium tank heater. Furthermore, Chow's layers 25 and 25', which the Examiner considers to be "a heat-resistant layer" as recited in claims 1 and 24, are protective layers whose function is to keep Chow's heating elements 22, 24, 22', and 24' from being exposed to the substrate on which thin films are being deposited to prevent the thin films from being contaminated by deposits arising from the heating of the heating elements 22, 24, 22', and 24', while Isaacson's element 40, which the Examiner also considers to be "a heat-resistant layer" as recited in claims 1 and 24, is a holder whose function is to mount the aquarium tank heater on the wall 14 of the aquarium tank 10 (see FIGS. 1-3 and column 2, lines 46-48, and column 3, lines 12-15, of Isaacson. In light of these differences in function, it is submitted that Isaacson is non-analogous art with respect to claims 1 and 24 and Chow pursuant to MPEP 2141.01(a)(II), such that the Examiner cannot rely on Isaacson in the rejection of claims 1 and 24 under 35 USC 103(a) pursuant to MPEP 2141.04(a)(I).

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 18 and 10 of the Appeal Brief of April 19, 2007, it is submitted that Chow and Isaacson do not disclose or suggest "a reflective layer between the cover heater and the heat-resistant layer" as recited in claim 1, or "a reflective layer between the body heater and the heat-resistant layer" as recited in claim 24.

Claims 2 and 18

The arguments with respect to claims 2 and 18 on pages 20-22 of the Appeal Brief of April 19, 2007, refer to MPEP 2101.01 on page 21, lines 2 and 3 of the paragraph beginning "Alternatively, assuming *arguendo*," and on page 22, line 1. However, this reference is incorrect. The correct reference is MPEP 2121.01.

On page 10 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

With respect to claims 2 and 18, the applicant argues Chow shows the cover heater having two wires and the body heater also having two wires, and this showing, the applicant argues, does not teach single wire formed on the entire surface of the cover heater and the body heater. It is noted that the recited one single wire in the cover heater and the body heater is clearly met by one of the two wires in each of the respective cover and the body heater. , i.e., two wires in Chow shows the recited single wire. Furthermore, Chow teaches that the cover can have one or more heating elements (column 2, lines 26-29), and this teaching would also be applicable to the body heater as Chow describes the heating arrangement with respect to the cover is also applicable to the body heater (see column 5, lines 49-53).

Despite this teaching in Chow, the applicant states that Chow which "alludes" to one heating element is "an error" since Chow does not actually disclose or suggest the feature. The examiner would not speculate whether or not Chow is in error when Chow clearly teaches such heating arrangement as described in column 2, lines 26-29. The applicant also states "assuming *arguendo* that the apparent allusion of Chow... is not an error, [and]the mere reference to one or more heating element does not provide an enabling disclosure for a cover having one heating element." This argument is deemed not persuasive. Chow teaches one heating element, and it clearly meets the recited single wire pattern.

However, the Examiner's position that "the recited one single wire in the cover heater and the body heater is clearly met by one of the two wires in each of the respective cover and the body heater. , i.e., two wires in Chow shows the recited single wire" ignores the plain English meaning of the word "single." which is not accompanied by another or others; solitary; consisting of one part, aspect, or section: *a single thickness; a single serving*; consisting of one

in number. *She had but a single thought, which was to escape.* *The American Heritage Dictionary of the English Language*, Fourth Edition, 2006, Houghton Mifflin Company.

Furthermore, with respect to the Examiner's statement that "the examiner would not speculate whether or not Chow is in error when Chow clearly teaches such heating arrangement as described in column 2, lines 26-29," it is submitted that the Examiner cannot simply ignore the possibility that the statement in column 2, lines 26-29, of Chow which appears to allude to an embodiment in which a cover heater has one heating element might in fact be an error since it is inconsistent with the rest of Chow's disclosure.

Furthermore, the Examiner has not addressed the applicant's arguments on pages 20 and 21 of the Appeal brief of April 19, 2007, pointing out that column 2, lines 26-29, of Chow relied on by the Examiner relates only to Chow's cover heater, and thus does not disclose or suggest the feature "wherein the entire body heater is constituted by a single wire pattern" recited in claim 18.

Furthermore, the Examiner has not addressed the applicants' arguments on pages 21 and 22 of the Appeal Brief of April 19, 2007, pointing out that the mere reference to "one or more heating elements on that cover about such an aperture" in column 2, lines 26-29, of Chow does not provide an enabling disclosure under the guidelines set forth in MPEP 2121.01 for a cover heater having one heating element when considered in light of the fact that Chow specifically provides two heating elements in two layers to provide very good temperature uniformity as described, for example, in column 3, line 66, through column 4, line 5; column 4, lines 18-21; and column 7, lines 8-10, of Chow.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 20-22 of the Appeal Brief of April 19, 2007, it is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the feature "wherein the entire cover heater is constituted by a single wire pattern formed over the entire top surface of the cover" recited in claim 2, or the feature "wherein the entire body heater is constituted by a single wire pattern formed over at least the entire outer side wall of the main body" recited in claim 18.

Claims 7 and 25

On pages 10 and 11 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

With respect to claims 7 and 25, the applicant argues that the insulating material made of pyrolytic boron nitride in Chow is not a "good heat radiation property," and that the examiner has failed to provided the basis to support the theory of inherency. The applicant further argues there are different insulating materials having different radiation property [*sic*], and no theory of inherency can be met when there is no basis in fact or technical reasoning. The applicant argue [*sic*] that the insulating material is disclosed as alumina, and this is not shown or taught by Chow. The applicant's argument is not deemed persuasive. It is noted that alumina as the insulating material has not been claimed, and all that is claimed by the applicant is an insulating material with no other structural support or material which does not distinguish the claimed insulating material from that of Chow in any form or shape. As discussed previously, when the structure or material recited in the reference is substantially identical as that of the claims, the claimed properties or functions are assumed inherent. All that is recited in the claims with respect to the material is that it is an insulating material with no other structure or composition. In such a broad claim, the prior art having the material made of an insulating material also meets the recited properties or functions.

However, claims 7 and 25 do not merely recite "an insulating material with no other structure or composition" as alleged by the Examiner. Rather, claim 7 recites that "the insulating material forming the cover has a good heat radiation property," and claim 25 recites that "the insulating material forming the main body has a good heat radiation property." Chow does not disclose or suggest that the pyrolytic boron nitride of which Chow's electrical insulating layer 23 is made has a good heat radiation property. Nor has the Examiner provided a basis in fact and/or technical reasoning to reasonably support a determination that pyrolytic boron nitride inherently has a good heat radiation property as required by MPEP 2112(V), which is discussed on page 13 of the Appeal Brief of April 19, 2007. The applicants' specification does not disclose that the "insulating material" recited in claims 7 and 25 may be pyrolytic boron nitride. Rather, the applicants' specification discloses that the "insulating material" recited in claims 7 and 25 may be alumina (Al₂O₃). However, Chow does not disclose that Chow's electrical insulating layer 23 may be made of alumina. In short, there is simply no basis whatsoever in Chow to

support the Examiner's determination that Chow's electrical insulating layer 23 is made of an insulating material that "has a good heat radiation property" as recited in claims 7 and 25 merely because Chow's electrical insulating layer 23 is made of an "insulating material" as recited in claims 7 and 25.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 22-24 of the Appeal Brief of April 19, 2007, it is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the feature "wherein the insulating material forming the cover has a good heat radiation property" recited in claim 7, or the feature "wherein the insulating material forming the main body has a good heat radiation property" recited in claim 25.

Claim 9

The arguments with respect to claim 9 on pages 24-27 of the Appeal Brief of April 19, 2007, refer to MPEP 2144.06 in the last two full paragraphs on page 26. The portion of the MPEP relied on there has been renumbered MPEP 2144.06(II) in the September 2007 revision of the MPEP.

The arguments with respect to claim 9 on pages 24-27 of the Appeal Brief of April 19, 2007, refer to MPEP 2143 in the paragraph bridging pages 25 and 26 and the paragraph bridging paragraphs 26 and 27. However, the portion of the MPEP relied on there has been deleted in the September 2007 revision of the MPEP.

In the September 2007 revision, MPEP 2143 has been retitled "Examples of Basic Requirements of a *Prima Facie* Case of Obviousness," and sets forth exemplary rationales (A)-(G) that may support a conclusion of obviousness. Exemplary rationale (G) is described as follows in MPEP 2143:

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Also, MPEP 2143(G) sets forth the following guidelines that the Examiner must follow to reject a claim based on this exemplary rationale (emphasis by underlining added):

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Then, Office personnel must articulate the following:

(1) a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;

(2) a finding that there was reasonable expectation of success; and

(3) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that "a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable [*sic*] expectation of success." *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006). If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.

The *Graham* factual inquiries referred to in the above passage are identified as follows in the September 2007 revision of MPEP 2141:

An invention that would have been obvious to a person of ordinary skill at the time of the invention is not patentable. See 35 U.S.C. 103(a). As reiterated by the Supreme Court in *KSR*, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

(A) Ascertaining the differences between the claimed invention and the prior art; and

(B) Ascertaining the differences between the claimed invention and the prior art; and

(C) Resolving the level of ordinary skill in the pertinent art.

On page 12 of the Examiner's Answer of November 8, 2007, the Examiner states as follows (emphasis added):

With respect to claim 9, the applicant argues that the examiner has relied on the applicant's own disclosure to meet the recited cover heater formed in a "concentric pattern around the nozzle." This argument is not deemed persuasive. Chow teaches that its crucible can have different shapes (also see Figures 2 and 7), but more importantly Chow teaches that having an [sic] uniform heating distribution is desired when operating this device (see column 1, lines 64-67). It was pointed previously to the applicant that a concentric pattern is not a critical element and other shapes can be provided to achieve such desired uniformity. The applicant also disclose [sic] in its specification that many other shape [sic] can be had (page 6, paragraph 31). Thus, having such concentric pattern or any other shapes would have been within the level of ordinary skill in the art to provide uniform and stable heating across the cover.

The Examiner's discussion of what he considers Chow to teach indicates that the Examiner has relied on the "teaching, suggestion, or motivation" rationale set forth in MPEP 2143(G) as discussed above.

Also, the Examiner has continued to rely on the statement in paragraph [0031] of the applicants' specification that "any other patterns which can be laid over the entire top surface of the cover 40 can be applied" as justification for his proposal to modify Chow's cover heater to be "formed in a concentric pattern around the nozzle" as recited in claim 9, ignoring the applicants' arguments on pages 25 and 26 of the Appeal Brief of April 19, 2007, pointing out that such reliance is prohibited by MPEP 2143 (portion relied on now deleted as discussed above and below) and 2144.06 (now renumbered 2144.06(II) as discussed above). However, the specific statement in MPEP 2143 that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclose (citing *In re Vaeck*) that was relied on in the Appeal Brief of April 19, 2007, has now been deleted.

However, as discussed above, MPEP 2143(G) now states that in order to use the "teaching, suggestion, or motivation" rationale to support a conclusion that a claim would have been obvious to one of ordinary skill in the art, the Examiner must make a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Here, the only teachings identified by the Examiner are (1)

"Chow teaches that its crucible can have different shapes (also see Figures 2 and 7)," and (2) "Chow teaches that having an [*sic*] uniform heating distribution is desired when operating this device (see column 1, lines 64-67)." However, the Examiner has not identified any teaching in Chow, Chandler, and Isaacson or elsewhere in the prior art to modify Chow's cover heater to be "formed in a concentric pattern around the nozzle" as recited in claim 9 as proposed by the Examiner, or that doing so would provide the "uniform heating distribution" taught by Chow. Accordingly, it is submitted that the Examiner cannot use the "teaching, suggestion, or motivation" rationale set forth in MPEP 2143(G) to support his conclusion that claim 9 would have been obvious to one of ordinary skill in the art.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 24-27 of the Appeal Brief of April 19, 2007, it is submitted that the Examiner has not identified any motivation whatsoever in Chow, Chandler, and Isaacson or elsewhere in the prior art to modify Chow's cover heater to be "formed in a concentric pattern around the nozzle" as recited in claim 9, such that the Examiner has not established a *prima facie* case of obviousness with respect to claim 9 pursuant to MPEP 2143.

Claim 16

On page 12 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

With respect to claim 16, the applicant argues the claim as amended is not a product by process and further argues that while the heating elements of Chow is achieved via the chemical vapor deposition, the recited heating block [*sic*] is rather achieved or constituted by the sprayed heat emitting material pattern. The examiner has construed the amended claim 16 as a product by process since the structure is defined by the process of "sprayed" by which he [*sic*] heat emitting material is provided thereto.

However, assuming *arguendo* that "sprayed" as recited in claim 16 is a process as alleged by the Examiner, the Examiner has not addressed the applicants' argument on page 28 of the Appeal Brief of April 19, 2007, that Chow's heating element pattern is clearly not a "heating block" as recited in claim 16 because, as would have been understood by one of ordinary skill in the art at the time the invention was made, a "heating block" does not have a

pattern. It is submitted that the "heating block" feature of claim 16 is clearly a structural limitation, rather than a product-by-process limitation, and thus was not addressed in the Examiner's explanations of the rejection, which are based solely on a product-by-process theory.

On page 12 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

And even if the claim is not deemed as a product by process, it is also noted that the chemical vapor deposition is the same method by which the heat emitting material is made (see page 7, lines 1-4 of the applicant's specification). Thus, the applicant's argument is not deemed persuasive.

The Examiner is apparently referring to paragraph [0032] on pages 6 and 7 of the applicant's specification, which reads as follows:

[0032] The cover heater 43 may be formed of platinum by screen printing. Any other materials and techniques capable of forming a thin-layered cover heater can be applied. For example, the cover heater 43 may be formed by printing a conductive paste containing metal particles and metal oxide on the surface of the cover 40 and sintering the printed conductive paste. Alternatively, a thin graphite layer may be formed on the cover 40 by chemical vapor deposition (CVD).

However, paragraph [0032] of the applicants' specification does not describe the features recited in claim 16, i.e., the features "wherein the cover heater is constituted by a sprayed heating block on the cover" and "wherein the sprayed heating block is constituted by a sprayed heat emitting material on the cover." Rather, these features are described, for example, in paragraph [0042] on pages 8 and 9 of the applicants' specification, which reads as follows:

[0042] In a heating crucible according to an embodiment of the present invention having such a structure as described above, in which a thin-layered heater is integrated into each of the cover and the main body of the heating crucible, although the heater has been described in the above embodiment as being a heating wire having a predetermined pattern, the heater may be formed as a heating block by spray coating a heat emitting material. For example, a spray-coated heater may be formed by spray coating a cover body with a heat emitting material and connecting positive and negative terminals to the cover heater, wherein the spray-coated cover heater generates heat as a predetermined voltage is

applied to the positive and negative terminals via external wires. In this case, it will be appreciated that a heat-resistant layer is formed over the spray-coated heater, and that at least one thermocouple is embedded in the cover body formed of an electrically insulating ceramic material having a good thermal radiation property, such as alumina. The same spray-coated heater can be applied to the main body of a heating crucible according to another embodiment of the present invention.

Thus, the rejection of claim 16 appears to be based at least in part on a misunderstanding by the Examiner of the features recited in claim 16.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 27 and 28 of the Appeal Brief of April 19, 2007, it is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the features "wherein the cover heater is constituted by a sprayed heating block on the cover" and "wherein the sprayed heating block is constituted by a sprayed heat emitting material on the cover" recited in claim 16.

Claims 29 and 30

On page 12 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

Regarding the recited single-layer cover or body heater, the applicant argues Chow shows a three layer cover heater which includes a first and a second heating element with an insulating layer. This argument is not deemed persuasive. Chow clearly teaches that only one heating element can be used, as shown in column 2, lines 27-30, and this teaching clearly meets the recited single layer cover heater and the single layer body heater.

However, the Examiner has merely paraphrased the arguments he made on page 10 of the Final Office Action of October 12, 2006. The Examiner has not addressed the arguments on pages 29 and 30 of the Appeal Brief of April 19, 2007, responding to the Examiner's arguments and pointing out why Chow, Chandler, and Isaacson do not disclose or suggest the features "wherein the cover heater is a single-layer cover heater" and "wherein the body heater is a single-layer body heater" recited in dependent claim 29, or the features "wherein the single-

layer cover heater is the only cover heater on the cover" and "wherein the single-layer body heater is the only body heater on the main body" recited in dependent claim 30.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 28-30 of the Appeal Brief of April 19, 2007, it is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the features "wherein the cover heater is a single-layer cover heater" and "wherein the body heater is a single-layer body heater" recited in claim 29, or the features "wherein the single-layer cover heater is the only cover heater on the cover" and "wherein the single-layer body heater is the only body heater on the main body" recited in claim 30.

Claim 31

The arguments with respect to claim 31 on page 30 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.04. However, this reference is incorrect. The correct reference is MPEP 2143.03.

The arguments with respect to claim 31 on page 30 of the Appeal Brief of April 19, 2007, refer to MPEP 2143. However, the portion of the MPEP relied on there has been deleted in the September 2007 revision of the MPEP.

Pursuant to the September 2007 revision of MPEP 2142, the Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness; if the Examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness; and the key to supporting any rejection under 35 USC 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious.

As discussed on page 30 of the Appeal Brief of April 19, 2007, the Examiner did not specifically discuss claim 31 in the Final Office Action of October 12, 2006, or otherwise address the feature "wherein the heat-resistant layer blocks heat generated by the cover heater from being transferred outside the heating crucible" recited in claim 31, such the Examiner has not clearly articulated the reasons why claim 31 would have been obvious as required by MPEP 2142, *supra*, and therefore has not established a *prima facie* case of obviousness with respect to claim 31 pursuant to MPEP 2142, *supra*.

Claims 4, 11-13, 17, 21, and 22

The arguments with respect to claims 4, 11-13, 17, 21, and 22 on page 31 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.04. However, this reference is incorrect. The correct reference is MPEP 2143.03.

Conclusion—Rejection 1

For at least the foregoing reasons and the reasons discussed on pages 10-31 of the Appeal Brief of April 19, 2007, it is respectfully requested that the rejection of claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson be reversed.

Rejection 2—Claims 3, 14, and 19

The arguments with respect to claims 3, 14, and 19 on page 31 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.04. However, this reference is incorrect. The correct reference is MPEP 2143.03.

For at least the foregoing reasons and the reasons discussed on page 31 of the Appeal Brief of April 19, 2007, it is respectfully requested that the rejection of claims 3, 14, and 19 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, and further in view of Kano be reversed.

Rejection 3—Claims 8, 15, and 26

The arguments with respect to claims 8, 15, and 26 on page 32 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.04. However, this reference is incorrect. The correct reference is MPEP 2143.03.

For at least the foregoing reasons and the reasons discussed on page 32 of the Appeal Brief of April 19, 2007, it is respectfully requested that the rejection of claims 8, 15, and 26 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, and further in view of Bichrt, be reversed.

Rejection 4—Claim 10

On pages 12 and 13 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

With respect to Okuda regarding the recited metal particles and metal oxide, the applicant argues that the metal nitride or carbide particles of Okuda do not meet the recited "metal particles". The applicant further states while Okuda shows the conductive pastes comprising metal nitrides/carbide particles with metal oxide, such composition does not meet the recited "metal particles and metal oxides." The applicant argues it is unreasonable to interpret the metal carbide/nitride particles which includes nonmetal carbon or nitrogen can be "metal particles". This argument is not deemed persuasive. The recited conductive paste comprising the metal particles and metal oxide clearly read on the composition of Okuda which includes the particles including metals, nonmetal and metal oxides, i.e., the recited composition is a subset of the Okuda composition. It is furthermore noted that the use of the open ended transitional phrase "comprising" allows the recited metal particles to include not only metals but also un-recited elements including nonmetal as well. This is not an unreasonable interpretation of the claim.

However, with respect to the Examiner's statement that "the use of the open ended transitional phrase 'comprising' allows the recited metal particles to include not only metals but also un-recited elements including nonmetal as well," claim 10 actually recites "wherein the conductive paste comprises metal particles and metal oxide." Although the use of the open-ended transitional phrase "comprises" allows the conductive paste "to include not only metals but also un-recited elements including nonmetal as well," it does not allow the metal particles "to include not only metals but also un-recited elements including nonmetal as well." The term "metal particles" is a closed term that excludes the metal nitride particles (TiN) and the metal carbide particles (WC) disclosed by Okuda that the Examiner considers to correspond to the "metal particles" recited in claim 10. Thus, the Examiner has improperly interpreted claim 10 as if it recited "wherein the conductive paste comprises (1) particles comprising metal and (2) metal oxide. It is submitted that Okuda does not disclose a conductive paste that comprises the combination of "metal particles and metal oxides" recited in claim 10 for the reasons discussed on pages 32-35 of the Appeal Brief of April 19, 2007.

Furthermore, it is submitted that the Examiner's interpretation of claim 10 is prohibited by the decision of *Dippin' Dots v. Mosey*, 476 F. 3d 1337, 1343, 81 USPQ2d 1633, 1637 (Fed. Cir. 2007). *Dippin' Dots* had a patent with a claim reciting "[a] method of preparing and storing a free-flowing, frozen alimentary dairy product, comprising the steps of: [six steps]." One of the six steps was "freezing said dripping alimentary composition into beads." *Dippin' Dots* essentially argued that this step should be interpreted as if it read "freezing said dripping alimentary composition into particles comprising beads." The Federal Circuit disagreed, stating as follows:

As to DDI's second argument, we acknowledge that the term "comprising" raises a presumption that the list of elements is nonexclusive. See *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997). However, "[c]omprising" is not a weasel word with which to abrogate claim limitations." *Spectrum Int'l, Inc. v. Sterilite Corp.*, 164 F.3d 1372, 1380 (Fed. Cir. 1998). "Comprising" appears at the beginning of the claim — "comprising the steps of" — and indicates here that an infringing process could practice other steps in addition to the ones mentioned. Those six enumerated steps must, however, all be practiced as recited in the claim for a process to infringe. The presumption raised by the term "comprising" does not reach into each of the six steps to render every word and phrase therein open-ended.

Under the above rationale, it is submitted that the Examiner's interpretation of the feature "wherein the conductive paste comprises metal particles and metal oxide" recited in claim 10 as if it read "wherein the conductive paste comprises (1) particles comprising metal and (2) metal oxide" is improper.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 32-35 of the Appeal Brief of April 19, 2007, it is submitted that Chow, Chandler, Isaacson, and Okuda do not disclose or suggest the features "wherein the cover heater is constituted by a sintered printed conductive paste on the cover" and "wherein the conductive paste comprises metal particles and metal oxide" recited in claim 10, and it is respectfully requested that the rejection of claim 10 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29 (presumably intended to be claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31), and further in view of Okuda, be reversed.

Rejection 5—Claim 20

The arguments with respect to claim 20 on pages 35 and 36 of the Appeal Brief of April 19, 2007, refer to MPEP 2143.04. However, this reference is incorrect. The correct reference is MPEP 2143.03.

For at least the foregoing reasons and the reasons discussed on pages 35 and 36 of the Appeal Brief of April 19, 2007, it is respectfully requested that the rejection of claim 20 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29 (presumably intended to be claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31), and further in view of Takagi, be reversed.

Rejection 6—Claim 27

On page 13 of the Examiner's Answer of November 8, 2007, the Examiner states as follows:

With respect to the recited "convergent-divergent nozzle", the applicant argues Chow does not show such nozzle. Figure 7 of Chow clearly shows a nozzle with a smaller opening lead to a large opening constitutes the convergent-divergent nozzle, i.e., the nozzle 19' of Chow which widens into a larger opening allows a divergent pattern. The Chen and Murakami references are also shown [*sic*] that such convergent-divergent nozzle is well known in the art.

However, it is submitted that the nozzle 19' in FIG. 7 of Chow is not a convergent-divergent nozzle as recited in claim 27 as alleged by the Examiner because it has only a divergent portion and does not have a convergent portion. Furthermore, the Examiner has not addressed the arguments on pages 36-38 of the Appeal Brief of April 19, 2007, pointing out why it would not have been obvious to replace Chow's nozzle 19' with the convergent-divergent nozzle disclosed by Chen or Murakami as proposed by the Examiner.

The arguments with respect to claim 27 on pages 36-38 of the Appeal Brief of April 19, 2007, refer to MPEP 2143 on page 38, lines 6 and 7. However, the portion of the MPEP relied on there has been deleted in the September 2007 revision of the MPEP.

However, the rejection of claim 27 is based on the Examiner's statement on page 7 of the Examiner's Answer of November 8, 2007, that "Chen and Murakami show that it is well known in the art to provide the gaseous outlet nozzle with a convergent-divergent nozzle that is flush with the gas outlet surface cover." Thus, the Examiner has relied on the "teaching, suggestion, or motivation" rationale set forth in MPEP 2143(G) as discussed above in connection with claim 9.

However, as discussed in the paragraph bridging pages 37 and 38 of the Appeal Brief of April 19, 2007, it is submitted that using the convergent-divergent nozzle allegedly disclosed by Chen and Murakami in Chow as proposed by the Examiner would produce a diverging material beam, thereby rendering Chow's crucible 10 unsuitable for its intended purpose of producing a converging material beam, such that there is no suggestion or motivation to modify Chow's crucible 10 to use Chen and Murakami's convergent-divergent nozzle pursuant to MPEP 2143.01(V) discussed on page 37 of the Appeal Brief of April 19, 2007. Accordingly, it is submitted that the Examiner has not clearly articulated the reasons why claim 27 would have been obvious as required by MPEP 2142, *supra*, and therefore has not established a *prima facie* case of obviousness with respect to claim 31 pursuant to MPEP 2142, *supra*.

Accordingly, for at least the foregoing reasons and the reasons discussed on pages 36-38 of the Appeal Brief of April 19, 2007, it is submitted that Chow, Chandler, Isaacson, Chen, and Murakami do not disclose or suggest the feature "wherein the nozzle is a convergent-divergent nozzle through which the gaseous organic substance comes out from the main body in a diverging pattern, thereby enabling the heating crucible to produce a diverging pattern of the gaseous organic substance" recited in claim 27, and it is respectfully requested that the rejection of claim 27 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25, and 29-31, and further in view of Chen or Murakami, be reversed.

Conclusion—Argument

In view of the law and the facts stated herein and in the Appeal Brief of April 19, 2007, it is submitted that the various combinations of Chow, Chandler, Isaacson, Kano, Bichrt, Okuda,

Takagi, Chen, and Murakami relied on by the Examiner do not disclose or suggest all of the features recited in claims 1-4, 7-27, and 29-31.

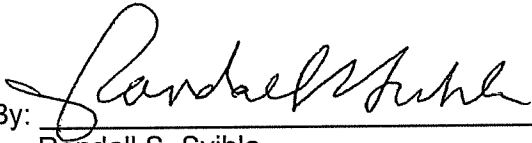
Accordingly, it is respectfully requested that the rejections of claims 1-4, 7-27, and 29-31 under 35 USC 103(a) as being unpatentable over the various combinations of Chow, Chandler, Isaacson, Kano, Bichrt, Okuda, Takagi, Chen, and Murakami relied on by the Examiner be reversed.

If there are any additional fees associated with the filing of this paper, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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VIII. CLAIMS APPENDIX (UPDATED)

1. (Previously presented) A heating crucible for an organic thin film forming apparatus, the heating crucible comprising:

- a main body in which to contain an organic substance;
- a cover provided on the main body, the cover formed of an insulating material and having a nozzle through which a gaseous organic substance comes out from the main body;
- a cover heater formed as a thin film type on the top surface of the cover;
- a heat-resistant layer formed on a surface of the cover heater;
- a reflective layer between the cover heater and the heat-resistant layer; and
- a body heater heating the main body.

2. (Previously presented) The heating crucible of claim 1, wherein the entire cover heater is constituted by a single wire pattern formed over the entire top surface of the cover, the single wire pattern of the entire cover heater having a positive terminal at a first end of the single wire pattern and a negative terminal at a second end of the single wire pattern.

3. (Previously presented) The heating crucible of claim 2, wherein the single wire pattern of the cover heater is constituted by printed platinum on the cover.

4. (Original) The heating crucible of claim 1, wherein the cover further comprises at least one embedded thermocouple.

5.-6. (Canceled)

7. (Original) The heating crucible of claim 1, wherein the insulating material forming the cover has a good heat radiation property.

8. (Original) The heating crucible of claim 7, wherein the cover is formed of alumina.

9. (Original) The heating crucible of claim 1, wherein the cover heater is formed in a concentric pattern around the nozzle.

10. (Previously presented) The heating crucible of claim 1, wherein the cover heater is constituted by a sintered printed conductive paste on the cover; and
wherein the conductive paste comprises metal particles and metal oxide.

11. (Previously presented) The heating crucible of claim 1, wherein the cover heater is constituted by a thin chemical vapor deposition graphite layer on the cover.

12. (Previously presented) The heating crucible of claim 1, wherein the insulating material forming the cover comprises a thermally conductive ceramic material.

13. (Previously presented) The heating crucible of claim 12, wherein the thermally conductive ceramic material comprises a ceramic nitride or a ceramic carbide.

14. (Original) The heating crucible of claim 13, wherein the ceramic nitride is aluminum nitride.

15. (Original) The heating crucible of claim 13, wherein the ceramic carbide is silicon carbide.

16. (Previously presented) The heating crucible of claim 1, wherein the cover heater is constituted by a sprayed heating block on the cover; and

wherein the sprayed heating block is constituted by a sprayed heat emitting material on the cover.

17. (Previously presented) The heating crucible of claim 1, wherein the main body is formed of the same insulating material forming the cover; and

wherein the body heater is formed as a thin film type on the outer wall of the main body.

18. (Previously presented) The heating crucible of claim 17, wherein the entire body heater is constituted by a single wire pattern formed over at least the entire outer side wall of the main body, the single wire pattern of the entire body heater having a positive terminal at a first end of the single wire pattern and a negative terminal at a second end of the single wire pattern.

19. (Previously presented) The heating crucible of claim 18, wherein the single wire pattern of the body heater is constituted by printed platinum on the body.

20. (Previously presented) The heating crucible of claim 18, wherein the single wire pattern of the body heater is further formed on the entire outer bottom wall of the main body.

21. (Original) The heating crucible of claim 17, wherein the insulating material forming the main body is a ceramic material.

22. (Original) The heating crucible of claim 17, wherein the main body further comprises at least one embedded thermocouple.

23. (Original) The heating crucible of claim 17, further comprising a heat-resistant layer on the surface of the body heater.

24. (Original) The heating crucible of claim 23, further comprising a reflective layer between the body heater and the heat-resistant layer.

25. (Original) The heating crucible of claim 17, wherein the insulating material forming the main body has a good heat radiation property.

26. (Original) The heating crucible of claim 25, wherein the main body is formed of alumina.

27. (Previously presented) The heating crucible of claim 1, wherein the nozzle is a convergent-divergent nozzle through which the gaseous organic substance comes out from the main body in a diverging pattern, thereby enabling the heating crucible to produce a diverging pattern of the gaseous organic substance.

28. (Previously presented) A heating crucible for an organic thin film forming apparatus, the heating crucible comprising:

a main body in which to contain an organic substance;

a cover provided on the main body, the cover formed of an insulating material and having a nozzle through which a gaseous organic substance comes out from the main body;

a cover heater formed as a thin film type on the top surface of the cover;

a heat-resistant layer formed on a surface of the cover heater;

a reflective layer between the cover heater and the heat-resistant layer; and

a body heater heating the main body;

wherein the nozzle extends from a surface of the cover facing toward the main body to a surface of the heat-resistant layer facing away from the main body;

wherein an entry opening of the nozzle through which the gaseous organic substance enters the nozzle is flush with the surface of the cover facing toward the main body;

wherein an exit opening of the nozzle through which the gaseous organic substance exits from the nozzle is flush with the surface of the heat-resistant layer facing away from the main body; and

wherein the nozzle converges from the entry opening to a throat of the nozzle at a junction between the cover and the heat-resistant layer, and diverges from the throat of the nozzle to the exit opening.

29. (Previously presented) The heating crucible of claim 1, wherein the cover heater is a single-layer cover heater; and

wherein the body heater is a single-layer body heater.

30. (Previously presented) The heating crucible of claim 29, wherein the single-layer cover heater is the only cover heater on the cover; and

wherein the single-layer body heater is the only body heater on the main body.

31. (Previously presented) The heating crucible of claim 1, wherein the heat-resistant layer blocks heat generated by the cover heater from being transferred outside the heating crucible.